TITLE OF THE INVENTION

IMPROVED CABLE FEEDING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to the field of home and commercial drain cleaning machinery, in particular mechanisms for advancing and retracting a cable snake drain cleaner.

Typical drain cleaning snakes are portable, electric-motor-driven mechanisms that pass a long articulated cable down a plumbing fixture to and through the sewer line. The intent is to use the sharp blades at the end of the rotating snake cable to slice through roots and other obstructions that periodically clog and stop drain pipes.

There are several previous inventions of a similar nature that provide feed control mechanisms for the snake, notably, U.S. Patent No. 5,901,401 to Rutkowski and No. 5,507,062 and 5,239,724 to Salecker. The technology of controlling the direction of the snake

cable and changing the motion of the cable by means of a set of rollers and control levers is well known.

The direction control mechanisms of these previous snake feeders are, in general, complex and possess multiple parts and connectors. There is an advantage to minimizing the number of moving parts and control levers to control the snake cable direction, and these earlier inventions make more or less successful attempts to achieve this advantage. The parts disposed in the interior of the cable feeder are regularly exposed to water and sewage, which leads to corrosion and rust. When the corrosion and rust reached a certain level in the feeder, it must be broken down and cleaned, or if that is not possible because of its construction, then it must be replaced. A cable feeder with the minimum number of moving parts and components exposed to the plumbing environment is the preferred implementation.

BRIEF SUMMARY OF THE INVENTION

The cable feeder of this invention is a simple metallic framework with a minimum of moving parts that provides a centrally disposed opening through which a snake cable passes. This opening is sizeable by means of an adjustment mechanism and possesses a set of three rollers that grip the cable. The rollers are canted in such a fashion that they grip the cable and allow it to advance or reverse depending on a position set by a control lever.

The control lever turns a face plate covering the main body of the invention. The rotating face plate adjusts three cams, one cam per roller, that alters the roller position. This technology is well-known.

The advancement offered by this invention resides in the simplicity of its construction and the reduced number of moving parts. Competing designs of similar cable controllers are

fundamentally hollow, flat cylinders that have many moving parts to control the cable direction. The present invention is a single piece main body and a single piece face plate. The main body has circumferential piston holes drilled through from the outer edge that contain the cams and the cams control the rollers through the pistons holes. The guide hole for the cable is sized by means of an adjustment screw, attached to one of the pistons.

BRIEF DESCRIPTION OF THE DRAWINGS

The construction and operation of the invention can be readily appreciated from inspection of the drawings that accompany this application.

Figure 1 is a perspective view of the invention.

Figure 2 is a front cross-section of the invention.

Figure 3 is cross-section of one of the cams in reverse control position

Figure 4 is cross-section of one of the cams in neutral control position

Figure 5 is cross-section of one of the cams in forward control position

Figures 6A, 6B, and 6C are an exploded diagram of the invention

DETAILED SPECIFICATION

Referring to Fig. 1, The cable guide[100] consists of a circular faceplate[101], a main body[102], an adjustment screw handle[108], a control handle[109], a plurality of piston screws[103], a plurality of piston screw access holes[104] in the faceplate[101], a connection screw[105], a lock ring[106], and a cable guide hole[107]. Referring to Figs 6A, 6B, and 6C, the internal workings of the invention are revealed. In Fig. 6B, the piston holes[110], cable guide hole[111], piston hole plate settings[112], cam screw holes[113], and connection screw[105] are shown.

In Fig. 6C, the arrangement of the pistons[116] can be seen. One piston[116] has an adjustment screw handle[108] inserted through the piston faceplate[114] and removably inserted into the top of the piston[116], the faceplate[114] removably attached to the main body[102]. The remaining pistons[116] have a piston faceplate[114] removably attached to the main body[102], but with a ball bearing

recess[115] in the main body under the piston faceplate[114]. Between the piston faceplate[114] and the top of the piston[116] is a spherical ball bearing[117] that helps the circular faceplate[101] turn when the control handle[109] is grasped and the circular faceplate[101] is turned around the cable guide hole[107]. This assembly prevents an air-tight seal and also prevents the piston assembly from drying out and becoming unlubricated.

At each piston central end[120] are cable guide cams[121] that engage the cable. The manner in which the cable guide cams[121] engage the cable is adjusted by the turning of the pistons[116] by means of rotating the circular faceplate[101] around the cable guide hole[107]. As the circular faceplate[101] is rotated, the three piston screws[103] attached fixedly to the pistons[116] move slightly left or right to the ends of the travel afforded by the cam screw access holes[113].

At one end of the travel, each piston[116] is rotated such that the cable guide cams[121] engage the cable in such a manner that the cable can advance through the cable guide hole[107]. At the other end of the travel, the cams[121] are positioned by the pistons[116] to enable the cable to only be reversed in direction.

In Fig. 2, the entire mechanism is seen in cross-section. Shown in this figure is the transverse grease fitting[130] and the circumferential grease fitting[131], These fittings are used to lubricate the invention. Fig. 3, 4, and 5 show how the rotation of the circular face plate[101] moves the piston screws[103] within the cam screw holes[113] such that the pistons[116] rotate in the desired direction. In Fig. 3, the mechanism supports reverse movement of the cable, in Fig. 4 the mechanism is in neutral position, and in Fig. 5 the cable will move in the forward direction.

While the foregoing describes a preferred embodiment, variation on this design and equivalent designs may be resorted to in the scope and spirit of the claimed invention.